Climate Change and Human Health Literature Portal

National Institute of
Environmental Health Sciences

Influence of relative humidity in Vibrio cholerae infection: A time series model

Author(s):	Rajendran K, Sumi A, Bhattachariya MK, Manna B, Sur D, Kobayashi N, Ramamurthy T
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Abstract:

Background & objectives: Spread of cholera in West Bengal is known to be related to its ecosystem which favours Vibrio cholerae. Incidence of cholera has not been correlated with temperature, relative humidity and rainfall, which may act as favourable factors. The aim of this study was to investigate the relational impact of climate changes on cholera. Methods: Monthly V. cholerae infection data for of the past 13 years (1996-2008), average relative humidity (RH), temperature and rainfall in Kolkata were considered for the time series analysis of Seasonal Auto-Regressive Integrated Moving Average (SARIMA) model to investigate relational impact of climatic association of V. cholerae infection and General Linear Model (GLM) for point estimation. Results: The SARIMA (1,0,0)(0,1,1) model revealed that monthly average RH was consistently linear related to V. cholerae infection during monsoon season as well as temperature and rainfall were non- stationary, AR(1), SMA(1) and SI(1) (P 7 cm) rainfall (10.1 ± 5.1, CVEuro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)50.1, P 5-10°C) range of temperature (29.00 ± 1.64, CVEuro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)5.6, P 80%) with 29°C temperature with intermittent average (10 cm) rainfall. This model also identified periodicity and seasonal patterns of cholera in Kolkata. Heavy rainfall indirectly influenced the V. cholerae infection, whereas no correlation was found with high temperature.

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Resource Description

Exposure : ⊠

weather or climate related pathway by which climate change affects health

 Ecosystem Changes, Meteorological Factors, Precipitation, Temperature

   Temperature: Fluctuations

Geographic Feature: ⊠

resource focuses on specific type of geography

 General Geographical Feature

Geographic Location: ⊠

resource focuses on specific location

 Non-United States

Non-United States: Asia

Asian Region/Country: India

Health Impact: ☒

specification of health effect or disease related to climate change exposure

 Infectious Disease, Morbidity/Mortality

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Cholera, Other Diarrheal Disease

Population of Concern: A focus of content

Population of Concern: ☒

populations at particular risk or vulnerability to climate change impacts

 Children

Resource Type: ☒

format or standard characteristic of resource

 Research Article

Timescale: ☒

time period studied

 Time Scale Unspecified